SOFTWARE FOR IMPROVING THE ACCURACY OF MACHINES

REFERENCE TO RELATED APPLICATION

Rb. 2/2/05

[0001] The present application is a continuation application based on U.S. Patent Application 08/~~869,857~~ 867,857, now US Patent 6,681,145, filed June 3, 1997, which claims the benefit of U.S. Provisional Application 60/019,196, filed June 6, 1996.

TECHNICAL FIELD

[0002] The present invention relates to machine control, and, more particularly, to a method using 3-dimensional laser measurement of the true position of a machine tool to augment the accuracy and control of a machine. The invention is especially useful in the accurate machining, inspecting, or both of a part based upon a digital definition of the part. A preferred method, apparatus, and related software provide end point control of the machine tool to place holes and other features accurately on aerospace structural detail parts.

BACKGROUND OF THE INVENTION

[0003] Machine tools exhibit dimensional positioning errors that are difficult to minimize. The primary contributors to these positioning errors are: (1) expansion and contraction of the machine structure and the workpiece (i.e., the part) because of thermal changes in the factory during machining, and (2) mechanical misalignments of and between individual axes of the machine. The accuracy of the machine is often so uncertain that post-machining inspection of the dimensions of the parts must be made using an independent measuring method. Such inspection requires special tools and skilled workers as well as significant factory space. It slows the production process.